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Yasuhiro Yagi

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03/21/2003

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EXAMINER:

BARBEE, MANUEL L

ART UNIT

PAPER NUMBER

2857

DATE MAILED: 03/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/800,515

Applicant(s)

YAGI ET AL.

Examiner

Manuel L. Barbee

Art Unit

2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Takehara et al. (US Patent No. 5,669,987).

With regard to measuring an output characteristic of a photovoltaic power system and comparing the measurement with a reference characteristic and diagnosing the normality/abnormality of the photovoltaic power system, as shown in claims 1 and 15, Takehara et al. teach measuring an output characteristic of at least two solar cells and comparing the measurements to diagnose whether a solar cell is abnormal (col. 2, line 24 - col. 3, line 19). With regard to the reference characteristic being obtained in accordance with an installation condition, as shown in claim 1, Takehara et al. teach taking into account a certain installation condition (col. 6, lines 14-21). With regard to diagnosing the power system normal only if the output is greater than a first predetermined value and lower than a second predetermined value, as shown in claim 1, Takehara et al. teach diagnosing abnormal solar cells for relatively low and relatively high outputs (col. 2, line 55 - col. 3, line 4).

With regard to the reference output characteristic and the output characteristic including voltage or current, Takehara et al. teach measuring and comparing voltage and current (col. 4, line 53 - col. 5, line 4).

With regard to using a second photovoltaic power system for the reference output, Takehara et al. teach using at least two solar cells and observing a solar cell that is relatively higher or lower than other normal solar cells (col. 2, line 40 - col. 3, line 4).

3. Claims 9, 10, 13, 14, 22 and 23 are rejected under 35 U.S.C. 102(a) as being anticipated by Asaoka (Japanese Patent Publication No. 2000022192 to Mitsubishi, English Translation).

With regard to storing a measurement result of a photovoltaic power system and diagnosing the abnormality/normality of the photovoltaic power system based on the measurement, as shown in claims 9, 10 and 22, Asaoka teaches using a decision unit to compare a measured value to a preset value to determine if snow is covering the light receiving surface, which would be an abnormality (Abstract). The decision unit implies a computer that inherently contains a storage means for values and instructions for operating on the values. With regard to using a past measurement, as shown in claims 9 and 22, and comparing the past measurement with a current measurement to determine abnormality, as shown in claim 10, Asaoka teaches comparing the measured voltage to voltage set using a measurement made beforehand (page 8, par. 18 - page 9, par. 19). With regard to determining the cause of the abnormality, as shown in claim 23, Asaoka teaches determining whether snow is covering the light receiving surface.

With regard to diagnosing the cause, as shown in claim 13, Asaoka teaches determining whether snow is covering the light receiving surface (Abstract). With regard to the output characteristic including direct current voltage, as shown in claim 14, Asaoka teaches measuring the output voltage of the solar battery (Abstract).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takehara et al. in view of Takeda (US Patent No. 5,594,313).

Takehara et al. do not teach that the installation condition is installation site, direction or angle and configuration, as shown in claim 2. Takeda teach taking into account the seasons and latitude or direction (col. 1, lines 16-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the abnormality detection method, as taught by Takehara et al., to include calculating the capacity in many installation conditions as taught by Takeda, because then the solar cell would have been used in many installation sites (col. 2, lines 36-41).

6. Claims 3, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takehara et al. in view of Asaoka.

Takehara teach all the limitations of claim 1 upon which claim 3 depends. Takehara et al. do not teach diagnosing the cause of abnormality based on the

comparison result, as shown in claim 3. Asaoka teaches determining whether snow is covering the light receiving surface (Abstract). It would have been obvious to one of ordinary skill in the art at time the invention was made to modify the abnormality detection method, as taught by Takehara et al., to include determining whether snow is covering the light receiving surface, because then a cause of failure could have been identified and corrected.

With regard to storing a reference characteristic in accordance with an installation condition and comparing the reference output with a measured output to determine abnormality if the output is outside of a range, as shown in claim 16, Takehara et al. teach measuring an output of a solar cell and determining abnormality if the output is outside of a range set in accordance with an installation condition, as shown above with regard to claim 1. Takehara et al. do not teach that the reference is obtained in advance, as shown in claim 16. Asaoka teach obtaining a reference condition beforehand as shown above with regard to claim 9. It would have been obvious to one of ordinary skill in the art at the time he invention was made to modify the abnormality detection method, as taught by Takehara et al., to include obtaining the reference condition beforehand, as taught by Asaoka, because then less signal processing would have been needed at the time of comparison.

With regard to a storage unit for storing the output characteristic measured, as shown in claim 17, Takehara et al. teach a comparing unit (Fig. 1, comparing unit 5).

7. Claims 5-8, 11, 12, 19-21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asaoka in view of Takeda (US Patent No. 5,594,313).

With regard to measuring an output characteristic of a photovoltaic power system and comparing the measurement with a reference characteristic and diagnosing the normality/abnormality of the photovoltaic power system, as shown in claims 5, 15 and 19, Asaoka teaches measuring the output voltage of a solar battery and comparing it to a preset value in a decision unit to determine if snow is covering the light receiving surface, which would be an abnormality (Abstract).

Asaoka does not teach that the reference characteristic is obtained or calculated in accordance with an installation condition using a past measurement, as shown in claim 5. Asaoka does not teach an input unit for accepting an input of an installation condition, as shown in claim 19. Takeda teaches calculating the capacity of a solar cell system taking into account the installation site (col. 1, lines 10-52). Takeda teaches allowing a correction factor to take into account variations in the installation site (col. 1, lines 24-33). The correction factor would allow for the input of installation conditions. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the snow coverage detector, as taught by Asaoka, to include calculating the capacity in many installation conditions as taught by Takeda, because then the solar cell would have been used in many installation sites (col. 2, lines 36-41).

With regard to diagnosing the cause, as shown in claims 7, Asaoka teaches determining whether snow is covering the light receiving surface (Abstract). With regard to the output characteristic including direct current voltage, as shown in claim 8, Asaoka teaches measuring the output voltage of the solar battery (Abstract). With regard to a storage unit, as shown in claim 20, Asaoka teaches using a decision unit (Abstract).

The decision unit implies a computer that inherently contains a storage means for values and instructions for operating on the values.

Asaoka does not teach an installation condition, as shown in claim 6, or that the reference output is obtained differently for each period of time among a plurality of periods gained by dividing a year, as shown in claim 11. Takeda teach taking into account the seasons and latitude or direction (col. 1, lines 16-30). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the snow coverage detector, as taught by Asaoka to include calculating the capacity in many installation conditions as taught by Takeda, because then the solar cell would have been used in many installation sites (col. 2, lines 36-41).

Asaoka does not teach excluding the measurement from subsequent reference output characteristic when the measurement is abnormal and including the measurement when it is normal, as shown in claim 12. The Examiner takes official notice that it is well known to only include normal measurements in reference calculations. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the snow coverage detector, as taught by Asaoka, to calculate the reference including only normal measurements, because then the reference value would not have been skewed by an abnormal measurement.

Asaoka does not teach solar radiation measurement, as shown in claims 21 and 24. Takeda teaches measuring solar radiation (col. 1, lines 17-21). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the snow coverage detector, as taught by Asaoka to include calculating the capacity in



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many installation conditions as taught by Takeda, because then the solar cell would have been used in many installation sites (Takeda, col. 2, lines 36-41).

8. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takehara in view of Asaoka as applied to claim 16 above, and further in view of Takeda.

Takehara et al. and Asaoka do not teach solar radiation measurement, as shown in claims 18. Takeda teaches measuring solar radiation (col. 1, lines 17-21). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the abnormality detection combination, as taught by Takehara et al. and Asaoka, to include calculating the capacity in many installation conditions as taught by Takeda, because then the solar cell would have been used in many installation sites (Takeda, col. 2, lines 36-41).

### ***Response to Arguments***

9. With regard to claims 22 and 23, Applicant states that JP '192 fails to disclose that past measurement results are taken into account in the normality/abnormality determination. The Examiner has obtained an English translation of this entire reference since the previous Office Action. In the English translation of JP '192 to Asaoka, Asaoka teaches comparing the measured voltage to voltage set using a measurement made beforehand (page 8, par. 18 - page 9, par. 19). Therefore Asaoka anticipates claims 9, 22 and 23.

With regard to claims 5 and 19, Applicant states that neither JP '192 nor Takeda teach the step of calculating a reference output characteristic in accordance with an installation condition of a photovoltaic power system. However, Takeda teaches

allowing a correction factor to take into account variations in the installation site (col. 1, lines 24-33). The correction factor corrects the reference measurement and therefore the reference measurement is calculated in accordance with an installation condition.

10. Applicant's arguments with respect to claims 1-4 and 9-18 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Groehl (US Patent No. 5,302,902) teach an abnormal battery cell voltage detection circuit.

Takehara (US Patent No. 6,278,052) teach abnormality detection in solar cells.

Kobayashi et al. (US Patent No. 6,512,458) teach detecting failure in a solar cell module.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Manuel L. Barbee whose telephone number is 703-308-0979. The examiner can normally be reached on Monday-Friday from 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on 703-308-1677. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-0976.

mlb  
March 14, 2003

  
MARC S. HOFF  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800